NON-PUBLIC?: N
ACCESSION #: 8808260003
LICENSEE EVENT REPORT (LER)

FACILITY NAME: South Texas Unit 1 PAGE: 1 of 4

DOCKET NUMBER: 05000498

TITLE: Reactor Trip Due to Personnel Error While Troubleshooting the Qualified Display Processing System
EVENT DATE: 07/19/88 LER #: 88-045-00 REPORT DATE: 08/18/88

OPERATING MODE: 1 POWER LEVEL: 054

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Charles Ayala - Supervising Licensing Engineer
TELEPHONE #: 512-972-8628

COMPONENT FAILURE DESCRIPTION:
CAUSE: A

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On July 19, 1988, at 0922 hours with Unit 1 in Mode 1 at 54 percent power, a reactor trip occurred on over temperature/delta temperature. No safety injection occurred and plant equipment performed as expected. The cause of the trip was personnel error. An HL&P Instrumentation and Controls (I&C) technician reset a channel of the Qualified Display Processing System (QDPS) while a redundant channel was in test. Corrective actions include addition of detailed instructions on QDPS reset to applicable procedures, training of I&C technicians, initiation of a verification by responsible foremen of I&C technician actions which could affect the operation of the Reactor Trip System (RTS), revision of maintenance procedures to include human factors considerations and an evaluation of the feasibility of revising the separation groups assigned to the QDPS processors to make them consistent with the RTS channels.

(End of Abstract)

DESCRIPTION OF OCCURRENCE:

At approximately 0922 hours on July 19, 1988, with Unit 1 in Mode 1 at approximately 54 percent thermal power, a reactor trip occurred as a result of a troubleshooting activity when an HL&P Instrumentation and Control (I&C) technician reset the wrong Qualified Display Processing System (QDPS) processor. The main turbine tripped upon reactor trip. A feedwater isolation occurred approximately 4 seconds later from low reactor coolant system average temperature (Tavg). Auxiliary feedwater actuation then occurred from low steam generator level. Steam generator levels dropped to approximately 26 percent on narrow range, except for Steam Generator 1A which dropped out of narrow range to approximately 48.9 percent wide range because the associated Auxiliary Feedwater Pump 11 was out of service. Steam Generator 1A was cross connected to the Steam Generator 1B Auxiliary Feedwater Pump 12 and level was restored to narrow range within approximately 2.5 minutes. Approximately 7 minutes after the reactor trip an operator closed the main steam isolation valves (MSIVs) to prevent excessive reactor coolant system cooldown. No safety injection actuation occurred and plant equipment operated as expected during this event. The NRC was notified pursuant to 10CFR50.72 at 1116 hours on July 19, 1988.

The QDPS is an integrated system designed to perform several functions, one of which is calculation of T(hot) based on the average of inputs from three resistance temperature detectors (RTD) on the hot leg of each Reactor Coolant System (RCS) loop. This calculated value is then passed to the Reactor Trip System (RTS) for monitoring. The QDPS consists of four processors which are associated with the four RTS channels. Each associated QDPS processor, RTS channel, RCS loop instrumentation and separation group are color coded alike to minimize confusion. The relationship between the QDPS processors, RTS protection cabinets, RCS loop temperature inputs and color coding is shown below.

RTS
QDPS Protection RCS Color
Processor Channel Loop Code

A I A Red

B III C Blue

C IV D Yellow

D II B White

DESCRIPTION OF OCCURRENCE Cont.:

On July 18, 1988, two HL&P I&C technicians were calibrating the RCS hot leg temperature inputs to QDPS. The calibration process may result in the associated QDPS processor becoming "locked up" which requires resetting from the QDPS room which is remote from the protection sets where the calibrations are performed. The technicians completed the calibration of the RCS loop B inputs to QDPS processor D at approximately 0350 hours on July 19, 1988. Because the procedure in use did not contain specific steps to ensure proper reset and they were unaware of the proper method to restore the system, they subsequently restored RCS loop B instrumentation channel with QDPS processor D locked up. This was discovered by an operator at 0358 hours and the I&C technicians were called back to troubleshoot the problem but were still unable to reset QDPS. At 0555 hours RTS channel II was declared inoperable and left in the test mode.

After the shift change at 0700 hours, a new technician was assigned to continue the troubleshooting. As part of the troubleshooting sequence, the technician incorrectly placed QDPS processor B in test (the QDPS processor associated with the RCS loop B temperature was processor D). The technician then informed the Control Room operator that he was going to reset the QDPS processor B and returned to the QDPS processor and operated the reset switch. Reset of QDPS processor B caused the calculated value of T(hot) to momentarily go to zero while RTS channel II was in test which resulted in a reactor trip on over temperature/delta temperature at 0922 hours.

CAUSE OF OCCURRENCE:

The root cause of the reactor trip was selection of the wrong QDPS cabinet by an experienced I&C Technician due to lack of mental attention. Even though the human factors elements of the troubleshooting activity associate the "B" QDPS processor with the "B" RCS loop, the I&C Technician involved had been sufficiently trained in QDPS channel identification and should have correctly chosen the "D" processor.

The root cause of returning the RCS loop B hot leg temperature channel to service with the QDPS processor D "locked up" was failure by the technicians to understand that the method to reset QDPS when restoring the system was different than when performing the calibration in the test mode. While they were fully trained and qualified to perform the calibration, their training in the area of system restoration was weak.

ANALYSIS OF EVENT:

Unplanned Reactor Protection System actuation is reportable under 10CFR50.73(a)(2)(iv). The reactor tripped as required and plant equipment

operated as expected. No unexpected post-trip transients occurred and there was no safety injection actuation. There were no adverse radiological or safety consequences as a result of this event.

CORRECTIVE ACTION:

The following corrective actions are being taken to prevent recurrence:

1. Training was held, immediately after the event, for I&C technicians to review the event and identify the need to exercise care when resetting QDPS.

2. Procedures which require the QDPS processors to be reset during restoration will be revised to include specific steps to ensure proper reset during restoration by September 15, 1988.

3. I&C foremen were instructed to verify the actions of I&C technicians which could affect the operation of the RTS. This has succeeded in increasing the awareness of the technicians when performing these actions. Since this is the first trip which was caused by I&C personnel error, a procedure change to require independent verification may not be warranted. However, the need for a change will be studied and, if needed, a schedule for implementation will be established by February 20, 1989.

4. The maintenance procedures which control work performed on equipment which could cause spurious trips will be evaluated for the inclusion of human factors aids such as identification of color codes of the equipment channels being maintained by February 20, 1989.

5. The separation groups assigned to the QDPS processors will be evaluated by engineering to determine the feasibility of changing them to agree with the RTS designations (i.e., RTS channel II with QDPS processor B) by February 20, 1989.

6. Key control measures are currently being studied to ensure that only one channel of the RTS may be accessed at a time. This study, along with a timetable for its implementation, will be completed by October 20, 1988.

ADDITIONAL INFORMATION:

There have been no previous LER's regarding inadvertent Reactor Trip System actuation due to personnel error.

One previous event was reported (LER 88-026) regarding a loss of offsite power caused by personnel error. This event resulted in a reactor trip and safety injection, however, it was not the result of a direct actuation of the Reactor Trip System.

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Houston Lighting & Power

August 18, 1988
ST-HL-AE-2759
File No.: G26
10CFR50.73

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project Electric Generating Station
Unit 1
Docket No. STN 50-498
Licensee Event Report 88-045 Regarding
Reactor Trip Due to Personnel Error While
Troubleshooting Qualified Display Processing System

Pursuant to 10CFR50.73, Houston Lighting & Power (HL&P) submits the attached Licensee Event Report (LER 88-045) regarding a reactor trip due to a personnel error while troubleshooting the Qualified Display Processing System. This event did not have any adverse impact on the health and safety of the public.

If you should have any questions on this matter, please contact Mr. C.A. Ayala at (512) 972-8628.

/s/ G. E. VAUGHN
G. E. Vaughn
Vice President
Nuclear Plant Operations

GEV/BEM/nl

Attachment: LER 88-045

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